CIRAS: Commercial Infrastructure for Robotic Assembly and Servicing (CIRAS)

Completed Technology Project (2016 - 2018)

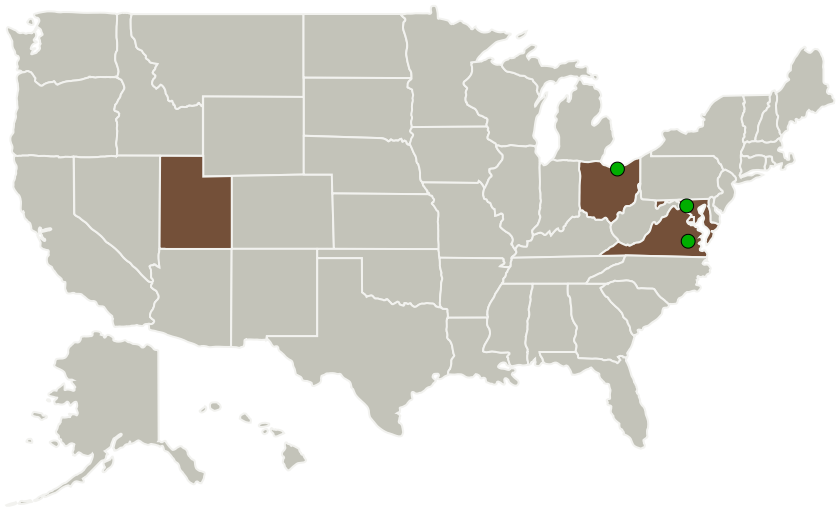
Project Introduction

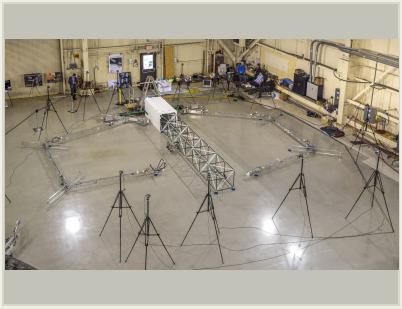
Commercial Infrastructure for Robotic Assembly and Servicing (CIRAS) project is pursuing space-based, robotic assembly of flight hardware and space systems, using innovative technologies including NASA's Tension Actuated Long-reach In-Space Manipulator (TALISMAN) to reduce the costs and potential human hazards associated with hardware transfer and assembly activities. The project aims to: demonstrate robotic reversible joining methods for mechanical and electrical connections; develop a feasible concept to validate space assembly geometries; and demonstrate repeatable module-to-module interfaces for in-space structural assembly.

Anticipated Benefits

CIRAS is developing tools to enable assembly of large modular structures in space and their reconfiguration as desired.

Primary U.S. Work Locations and Key Partners





Innovative NASA robotic technologies such as TALISMAN, seen here during calibration tests at NASA's Langley Research Center, are critical to the CIRAS project, which seeks to enable space-based, robotic assembly of flight hardware an...

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Organizations Performing Work	Role	Type	Location
Northrop Grumman Aerospace Systems(NGAS)	Lead Organization	Industry	Redondo Beach, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
Naval Research Laboratory(NRL)	Supporting Organization	US Government	Washington, District of Columbia

Primary U.S. Work Locations	
District of Columbia	Maryland
Ohio	Utah
Virginia	

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Northrop Grumman Aerospace Systems (NGAS)

Responsible Program:

Technology Demonstration Missions

Project Management

Program Director:

Trudy F Kortes

Program Manager:

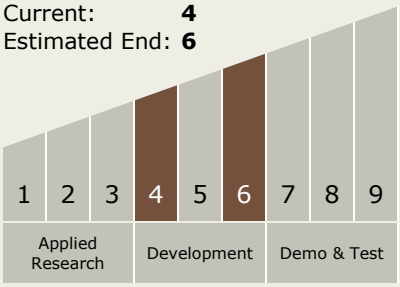
Tawnya P Laughinghouse

Principal Investigator:

Charles L Adams

Technology Maturity (TRL)

Start: **4**
Current: **4**
Estimated End: **6**



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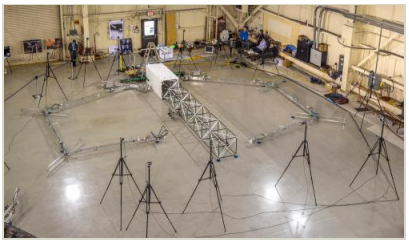
Images



Robotic In-Space Manufacturing and Assembly of Spacecraft and Space Structures.jpg
Innovative NASA robotic technologies such as TALISMAN, seen here during calibration tests at NASA's Langley Research Center, are critical to the CIRAS project, which seeks to enable space-based, robotic assembly of flight hardware and space systems
(https://techport.nasa.gov/image/100838)

Project Website:

https://www.nasa.gov/mission_pages/tdm/main/index.html#.VQb6XUjJzyE

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.3 Mechanical Systems
    - TX12.3.2 Electro-Mechanical, Mechanical, and Micromechanisms

Target Destinations

Earth, The Moon, Mars

Supported Mission Type

Push